CLAIMS

We claim:

1. A method for inducing an immune response in a human or animal wherein said human or animal has a deficiency in CD4+ T cells, said method comprising the step of administering to a human or animal deficient in T cells an immunogenic composition comprising a sialic acid binding component and at least one antigen of a target cell or target virus, whereby a humoral immune response specific for at least one antigen of the target cell or target virus is induced .

2. The method of claim 1 wherein the immune response is a humoral immune response.

3. The method of claim 1 wherein said sialic acid binding component is a hemagglutinin.

4. The method of claim 2 wherein said hemagglutinin is a viral hemagglutinin.

5. The method of claim 4 wherein said viral hemagglutinin is from an orthomyxovirus.

6. The method of claim 5 wherein said viral hemagglutinin is from influenza virus.

7. The method of claim 4 wherein said viral hemagglutinin is from a paramyxovirus.

8. The method of claim 4 wherein said viral hemagglutinin is comprised in an attenuated virus preparation.

9. The method of claim 4 wherein said viral hemagglutinin is comprised within an inactivated virus preparation.

10. The method of claim 8 wherein the virus preparation is inactivated with formalin or β-propiolactone.

11. ~~The method of claim 4 wherein the at least one~~ antigen of a target cell is from a bacterial ~~pathogen cell.~~

12. The method of claim 11 wherein the bacterial pathogen cell has a sialic acid capsule and wherein said capsule in present in said immunogenic composition.

13. The method of claim 12 wherein said bacterial pathogen is *Neisseria meningitidis*.

14. The method of claim 12 wherein said bacterial pathogen is *Escherichia coli*.

15. The method of claim 2 herein said target cell is a tumor cell.

16. The method of claim 2 wherein said target virus is an enveloped virus.

17. The method of claim 16 wherein said enveloped virus is simian immunodeficiency virus, human immunodeficiency virus, feline immunodeficiency virus, or bovine immunodeficiency virus, rabies virus, measles virus, vesicular stomatitis virus, flavivirus, alphavirus or herpes virus.

18. The method of claim 17 wherein said alphavirus is Sindbis virus, Semliki forest virus, Venezuelan equine encephalitis virus, eastern equine encephalitis virus, western equine encephalitis virus, Ross River virus, Mayaro virus, O'nyong-nyong virus or chikungunya virus.

19. The method of claim 17 wherein the flavivirus is Dengue virus, yellow fever virus, St. Louis encephalitis virus, Japanese encephalitis virus, Murray Valley encephalitis virus, West Nile virus, Rocio virus, tick-borne encephalitis virus, Omsk hemorrhagic fever virus, Kyasanur Forest disease virus, or Powassan virus.

20. The method of claim 9 wherein the immunogenic composition comprises an inactivated virus comprising a hemagglutinin or inactivated target cell or target virus and a carrier.

21. An immunogenic composition comprising a sialic acid binding component and an inactivated or attenuated target cell or an inactivated or attenuated target virus.

22. The immunogenic composition of claim 21 wherein said sialic acid binding component is a hemagglutinin of an orthomyxovirus or a paramyxovirus.

23. The immunogenic composition of claim 21 wherein said sialic acid binding component is comprised in an inactivated or attenuated preparation of an orthomyxovirus or paramyxovirus.

24. The immunogenic composition of claim 22 further comprising a virus like particle or an inactivated or attenuated sialic acid containing virus preparation.

25. The immunogenic composition of claim 24 wherein said virus preparation is an enveloped virus preparation.

26. The immunogenic composition of claim 25 wherein said is an inactivated tumor cell. virus preparation is a preparation of simian immunodeficiency virus, human immunodeficiency virus, feline immunodeficiency virus, or bovine immunodeficiency virus, rabies virus, measles virus, vesicular stomatitis virus, flavivirus, alphavirus or herpes virus.

27. The immunogenic composition of claim 26 wherein said alphavirus is Sindbis virus, Semliki forest virus, Venezuelan equine encephalitis virus, eastern equine encephalitis virus, western equine encephalitis virus, Ross River virus, Mayaro virus, O'nyong-nyong virus or chikungunya virus.

28. The immunogenic composition of claim 26 wherein the flavivirus is Dengue virus, yellow fever virus, St. Louis encephalitis virus, Japanese encephalitis virus, Murray Valley encephalitis virus, West Nile virus, Rocio virus, tick-borne encephalitis virus, Omsk hemorrhagic fever virus, Kyasanur Forest disease virus, or Powassan virus.

29. The immunogenic composition of claim 21 wherein the target cell is a tumor cell.

30. The method of claim 21 wherein the at least one antigen of a target cell is from a bacterial pathogen cell.

31. The method of claim 30 wherein the bacterial pathogen cell has a sialic acid capsule and wherein said capsule in present in said immunogenic composition.

32. The method of claim 31 wherein said bacterial pathogen is *Neisseria meningitidis*.

33. The method of claim 30 wherein said bacterial pathogen is *Escherichia coli*.

34. An immunogenic composition comprising a sialic acid binding component and at least one antigen of a target cell or target virus.

35. The immunogenic composition of claim 34 wherein the sialic acid binding component is a hemagglutinin of an orthomyxovirus or a paramyxovirus.

36. The immunogenic composition of claim 35 wherein the composition comprises inactivated or attenuated orthomyxovirus or paramyxovirus.

37. The immunogenic composition of claim 34 wherein the at least one antigen of a target cell or target virus comprises sialic acid or polymerized sialic acid.

38. The immunogenic composition of claim 37 wherein the at least one antigen of a target cell or target virus is comprised within inactivated or attenuated target cell or inactivated or attenuated target virus or virus- like particles of a target virus.

39. The immunogenic composition of claim 38 wherein the target cell is *Neisseria meningitidis* or *Escherichia coli*.

40. The immunogenic composition of claim 38 wherein the target virus is simian immunodeficiency virus, human immunodeficiency virus, feline immunodeficiency virus, or bovine immunodeficiency virus, rabies virus, measles virus, vesicular stomatitis virus, flavivirus, alphavirus or herpes virus.

41. The immunogenic composition of claim 40 wherein said alphavirus is Sindbis virus, Semliki forest virus, Venezuelan equine encephalitis virus, eastern equine encephalitis virus, western equine encephalitis virus, Ross River virus, Mayaro virus, O'nyong-nyong virus or chikungunya virus.

42. The immunogenic composition of claim 40 wherein the flavivirus is Dengue virus, yellow fever virus, St. Louis encephalitis virus, Japanese encephalitis virus, Murray Valley encephalitis virus, West Nile virus, Rocio virus, tick-borne encephalitis virus, Omsk hemorrhagic fever virus, Kyasanur Forest disease virus, or Powassan virus.

43. The immunogenic composition of claim wherein the target cell is a tumor cell.

44. A method for inducing an immune response in a human or animal, said method comprising the steps of administering an immunogenic composition comprising a sialic acid binding compo component and at least one antigen of a target cell or target virus, whereby a humoral immune response specific for at least one antigen of the target cell or target virus is induced.

45. The method of claim 44 wherein the immune response is a humoral immune response.

46. The method of claim 45 wherein said sialic acid binding component is a hemagglutinin.

47. The method of claim 46 wherein said hemagglutinin is a viral hemagglutinin.

48. The method of claim 47 wherein said viral hemagglutinin is from an orthomyxovirus or a paramyxovirus.

49. The method of claim 48 wherein said viral hemagglutinin is from influenza virus.

50. The method of claim 47 wherein said viral hemagglutinin is comprised in an attenuated virus preparation.

51. The method of claim 47 wherein said viral hemagglutinin is comprised within an inactivated virus preparation.

52. The method of claim 51 wherein the virus preparation is inactivated with formalin or β-propiolactone.

53. The method of claim 46 wherein the at least one antigen of a target cell is from a bacterial pathogen cell.

54. The method of claim 53 wherein the bacterial pathogen cell has a sialic acid capsule and wherein said capsule in present in said immunogenic composition.

55. The method of claim 54 wherein said bacterial pathogen is *Neisseria meningitidis* or *Escherichia coli*.

56. The method of claim 46 wherein said target cell is a tumor cell.

57. The method of claim 56 wherein said target virus or is an enveloped virus.

58. The method of claim 57 wherein said enveloped virus is simian immunodeficiency virus, human immunodeficiency virus, feline immunodeficiency virus, or bovine immunodeficiency virus, rabies virus, measles virus, vesicular stomatitis virus, flavivirus, alphavirus or herpes virus.

59. The method of claim 58 wherein said alphavirus is Sindbis virus, Semliki forest virus, Venezuelan equine encephalitis virus, eastern equine encephalitis virus, western equine encephalitis virus, Ross River virus, Mayaro virus, O'nyong-nyong virus or chikungunya virus.

60. The method of claim 58 wherein the flavivirus is Dengue virus, yellow fever virus, St. Louis encephalitis virus, Japanese encephalitis virus, Murray Valley encephalitis virus, West Nile virus, Rocio virus, tick-borne encephalitis virus, Omsk hemorrhagic fever virus, Kyasanur Forest disease virus, or Powassan virus.

61. The method of claim 62 wherein the immunogenic composition comprises an inactivated virus comprising a hemagglutinin or inactivated target cell or target virus and a carrier.